

Applicants: Young-Wook KIM et al.  
Serial No.: 10/670,040  
Filed: September 23, 2003  
Page 6

REMARKS

Claims 1-16 were pending in this application, claims 1-2 and 4 have been amended, claims 3, 5, 7-8, 11, and 13-14 have been canceled, and claims 10 and 16 have been withdrawn. Accordingly, claims 1, 2, 4, 6, 9, 12, and 15 are presently being examined.

Sections 2 to 4 of the Office Action rejected claims 1-9 and 11-15 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,358,910 to Atwell et al. ("Atwell patent") in view of U.S. Patent No. 5,616,650 to Becker et al. ("Becker patent").

More specifically, the Office Action stated that although the Atwell patent teaches methods of making porous ceramics from preceramic polymers and ceramic powders, the Atwell patent does not teach hollow microspheres. However, the Office Action also stated that the Becker patent teaches similar preceramic polymer compositions combined with solid and hollow filler materials, and thus, renders obvious the use of hollow microspheres or bubbles with the ceramic powder filler of the Atwell patent. Further, the Office Action stated that because the materials taught by the Becker patent are different than the preceramic polymer the "hollow sphere or bubbles" would be expandable.

Applicants hereinabove have amended claims 1 and 4 to more clearly recite that: (1) the fabricated ceramic has a porosity of "not less than 60%"; (2) the fabricated ceramic has a pore density of "not less than  $10^9$  pores/cm"; (3) 20% or more of the starting materials by weight is preceramic polymer powder (from canceled claims 7 and 13); (4) 20% or more of the starting materials by weight is expandable hollow microspheres (from

Applicants: Young-Wook KIM et al.  
Serial No.: 10/670,040  
Filed: September 23, 2003  
Page 7

canceled claims 8 and 14); and (5) the molded body is heated to between 110° and 200°C to expand the molded body and the microspheres (from canceled claims 5 and 11). Claim 1 has been further amended to recite that the ceramic powder is less than 50% of the starting materials by weight (from canceled claim 3), and claim 2 has been amended to delete "SiC". Support for these amendments can be found, inter alia, on from page 13, line 14 to page 14, line 15, on page 16 in lines 5-16, and on page 23 in Tables 3 and 4 of the subject specification.

Applicants respectfully submit that, unlike the subject invention as recited in amended claims 1 and 4, the Atwell patent always requires a sintering process and realizes a porosity of only 9.5% ~ 32.5% (see Table 2 of the Atwell patent). In contrast, even though the subject invention as recited in amended claims 1 and 4 does not include a sintering process, high porosity of not less than 60% is achieved. Therefore, compared to the Atwell patent, the process of the present invention achieves higher porosity by a simpler method. Furthermore, the subject invention specifies, as recited in amended claims 1 and 4, that the molded body may be easily expanded at temperatures from 110 to 200°C. The Atwell patent does not teach or suggest such simple heating to expand the molded body.

The Becker patent also fails to teach or suggest the simpler method of the subject invention. Instead, the Becker patent only briefly mentions filler or reinforcement materials. While one of these materials is "microspheres (both hollow and solid)", the size and character of the microspheres are not

Applicants: Young-Wook KIM et al.  
Serial No.: 10/670,040  
Filed: September 23, 2003  
Page 8

discussed. In contrast to the Becker patent, the microspheres of the subject invention as recited in amended claims 1 and 4, are specified as being "expandable" hollow microspheres. Indeed, according to the subject invention, if the expandable hollow microspheres are heated to between 110° and 200°C at atmospheric pressure, the shell is softened and the inner medium expands to form spherical hollow spheres having an average diameter of 10-200 µm. Since neither the Becker patent nor the Atwell patent, alone or in combination, teach or suggest heating "expandable hollow microspheres" in the recited temperature range to expand the hollow microspheres as recited in amended claims 1 and 4, one of ordinary skill in the art would not know to heat such microspheres from 110° to 200°C and thereby expand the microspheres.

Furthermore, the subject invention specifies, and recites in amended claims 1 and 4, that the mixture includes '20% or more of "expandable hollow microsphere" based on the total weight of the starting materials. Neither, the Becker patent nor the Atwell patent, alone or in combination, teach or suggest a minimum amount of microspheres to achieve a desired porosity, see page 13, line 25 to page 14, line 5 of the subject specification.

Accordingly, applicants respectfully submit that neither the Atwell patent nor the Becker patent, either or alone or in combination, teach or suggest the subject invention as recited in amended claims 1 and 4.

Because claims 2, 6, 9, 12, and 15 depend upon amended claims 1 and 4, claims 2, 6, 9, 12 and 15, as amended, are

Applicants: Young-Wook KIM et al.  
Serial No.: 10/670,040  
Filed: September 23, 2003  
Page 9

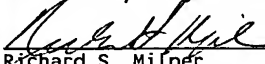
subject to all the limitations of amended claims 1 and 4. Accordingly, applicants respectfully submit that claims 2, 6, 9, 12, and 15 are not unpatentable over the Atwell patent in view of the Becker patent, for at least the same reasons discussed above with respect to amended claims 1 and 4.


In view of the remarks above, the cancellation of claims 3, 5, 7, 8, 11, 13 and 14, and the amendments to claims 1, 2, and 4, applicants respectfully request that the rejection of claims 1-9 and 11-15 be reconsidered and withdrawn and earnestly solicit allowance of the claims as amended.

If a telephone interview would be of assistance in advancing prosecution of the subject application, applicants' undersigned attorney invites the Examiner to telephone him at the number provided below.

No fee is deemed necessary in connection with the filing of this Amendment. However, if any fees are required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,

I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450	
 Richard S. Milner Reg. No. 33,970	<u>28 March 2005</u> Date

  
Richard S. Milner  
Registration No. 33,970  
Attorney for Applicants  
Cooper & Dunham LLP  
1185 Avenue of the Americas  
New York, New York 10036  
(212) 278-0400